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Fukata

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(54) **IMAGE FORMING APPARATUS STORAGE FILES WITH FILE ATTRIBUTION TABLE HAVING DELETION DATE AND FLAG**

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USPC **358/1.16**; 348/333.05; 707/999.007; 707/999.204

(58) **Field of Classification Search**
USPC 348/333.05; 358/1.16; 707/999.007, 707/999.204
See application file for complete search history.

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(57) **ABSTRACT**

Responding to an instruction accompanied with data having a folder path and a saving period from a computer, a record having the data is added to a saving period table. Responding to an instruction accompanied with a document file and a folder path from the computer, a file registration process is executed wherein a record is added to a file attribution table, the record having a document file path, a total number of pages, a data size, a file registration date, and a scheduled date of file deletion; the document file is stored in the folder; and a thumbnail of the first page of the file is created. Responding to a view instruction from the computer, an HTML file is created by relating records in the file attribution table with respective thumbnails to send it to the computer. Document files whose saving periods have ended are automatically deleted.

9 Claims, 9 Drawing Sheets

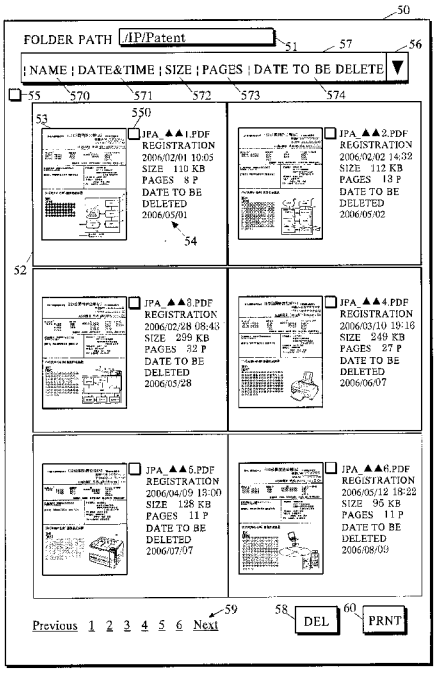

FIG.1

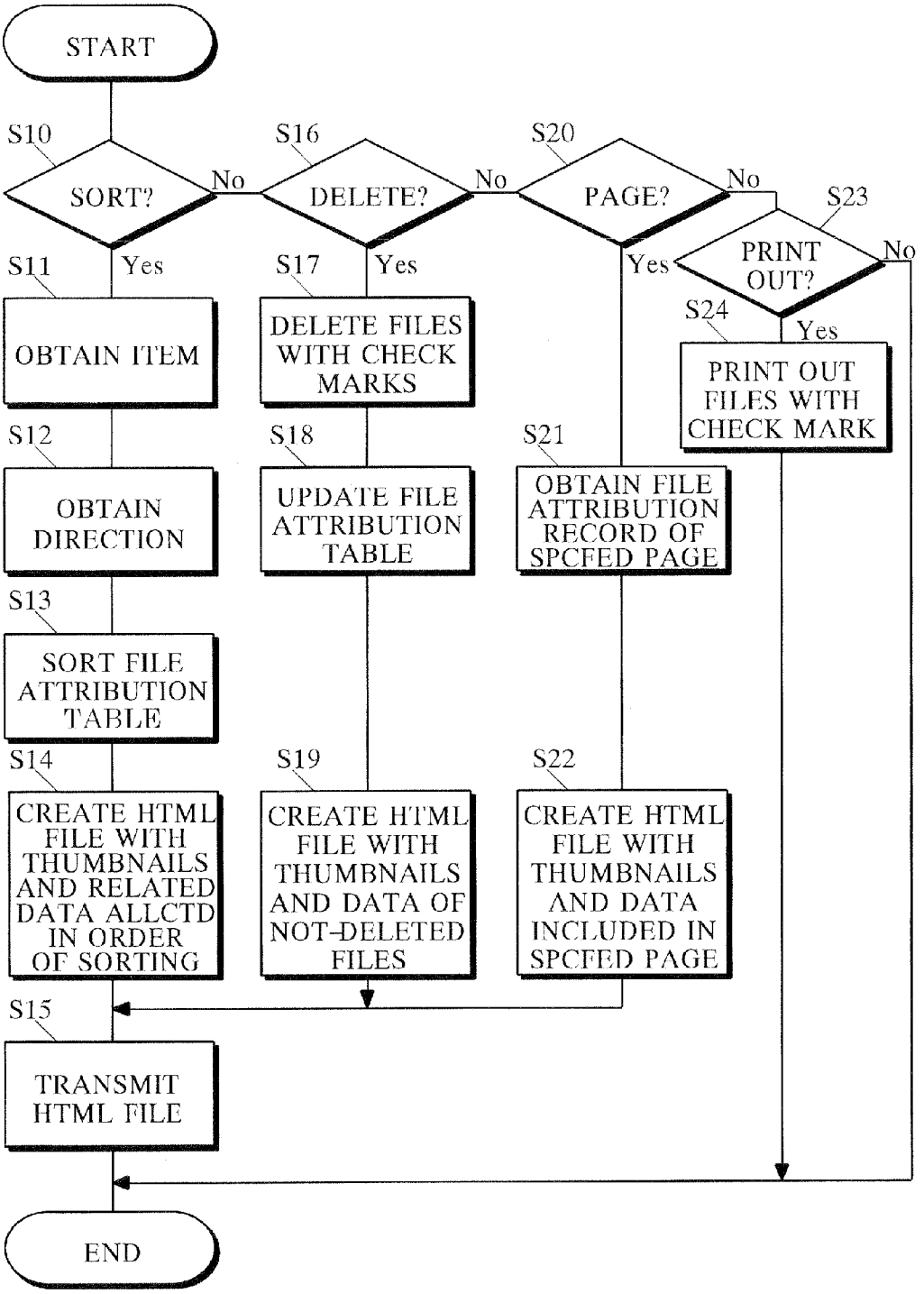
START
S10
SORT?
No
S16
DELETE?
No
S20
PAGE?
No
S23
PRINT OUT?
No
S11
Yes
OBTAIN ITEM
S12
OBTAIN DIRECTION
S13
SORT FILE ATTRIBUTION TABLE
S14
CREATE HTML FILE WITH THUMBNAILS AND RELATED DATA ALLCTD IN ORDER OF SORTING
S17
Yes
DELETE FILES WITH CHECK MARKS
S18
UPDATE FILE ATTRIBUTION TABLE
S19
CREATE HTML FILE WITH THUMBNAILS AND DATA OF NOT-DELETED FILES
Yes
S21
OBTAIN FILE ATTRIBUTION RECORD OF SPCFED PAGE
S22
CREATE HTML FILE WITH THUMBNAILS AND DATA INCLUDED IN SPCFED PAGE
S24
Yes
PRINT OUT FILES WITH CHECK MARK
S15
TRANSMIT HTML FILE
END

FIG.2

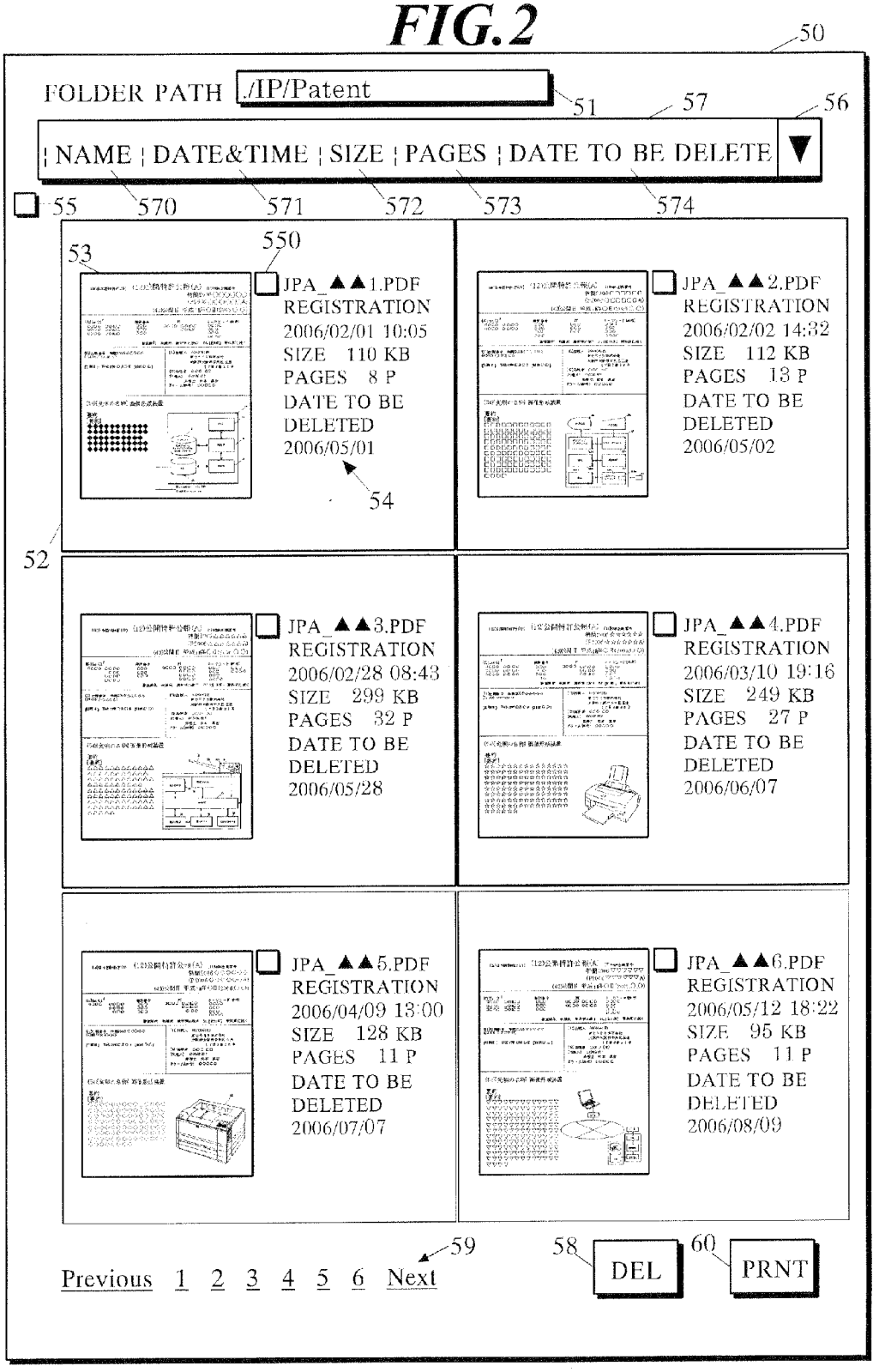
50
FOLDER PATH ./IP/Patent
51
57
56
NAME | DATE&TIME | SIZE | PAGES | DATE TO BE DELETE
55
570
571
572
573
574
53
550
JPA_▲▲1.PDF
REGISTRATION
2006/02/01 10:05
SIZE 110 KB
PAGES 8 P
DATE TO BE
DELETED
2006/05/01
54
JPA_▲▲2.PDF
REGISTRATION
2006/02/02 14:32
SIZE 112 KB
PAGES 13 P
DATE TO BE
DELETED
2006/05/02
52
JPA_▲▲3.PDF
REGISTRATION
2006/02/28 08:43
SIZE 299 KB
PAGES 32 P
DATE TO BE
DELETED
2006/05/28
JPA_▲▲4.PDF
REGISTRATION
2006/03/10 19:16
SIZE 249 KB
PAGES 27 P
DATE TO BE
DELETED
2006/06/07
JPA_▲▲5.PDF
REGISTRATION
2006/04/09 13:00
SIZE 128 KB
PAGES 11 P
DATE TO BE
DELETED
2006/07/07
JPA_▲▲6.PDF
REGISTRATION
2006/05/12 18:22
SIZE 95 KB
PAGES 11 P
DATE TO BE
DELETED
2006/08/09
59
Previous 1 2 3 4 5 6 Next
58
DEL
60
PRNT

FIG.3A FILE ATTRIBUTION TABLE

330

FILE PATH	REGISTRATION	SIZE (MB)	PAGES	(SCHEDULED)DEL	DLTED
/Develop1/KM-C830/Manual.pdf	2005/01/04 10:12	11.032	52	0	No
/Develop1/KM-C830/Sekkei.pdf	2005/05/03 13:39	9.526	37	0	No
⋮	⋮	⋮	⋮	⋮	⋮
/Develop1/Kikaku/Presen1.pdf	2005/12/19 23:30	2.128	10	2006/01/17	Yes
⋮	⋮	⋮	⋮	⋮	⋮
/IP/Patent/JPA_▲▲1.pdf	2006/02/01 10:05	0.110	88	2006/05/01	No
⋮	⋮	⋮	⋮	⋮	⋮

FIG.3B SAVING PERIOD TABLE

331

FOLDER PATH	SVNG PRD (DAY)
/Develop1/KM-C830	0
/Develop1/Kikaku	30
/IP/Patent	90
/Sale/Meibo	0
⋮	⋮

FIG.4

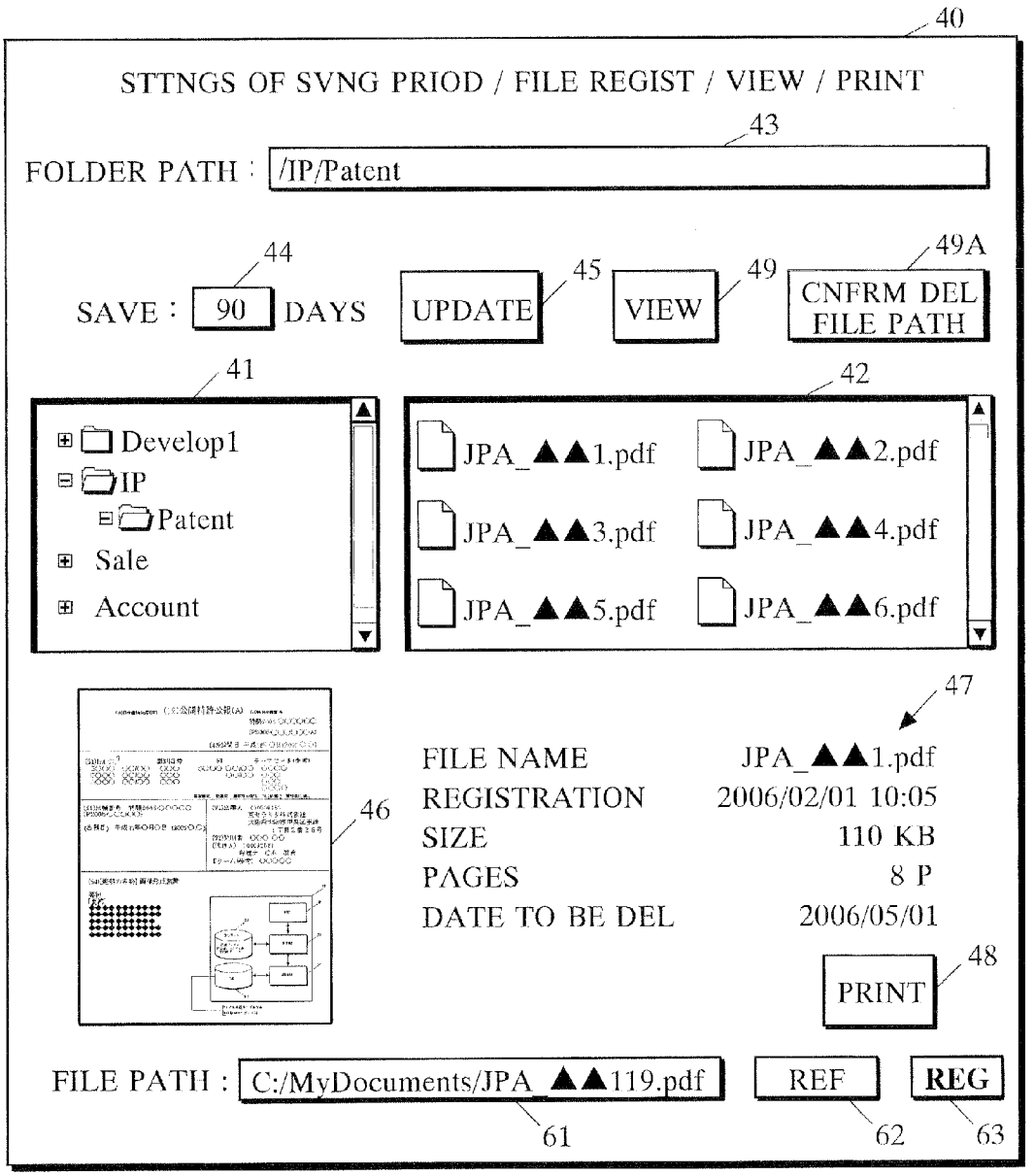
40
STTNGS OF SVNG PRIOD / FILE REGIST / VIEW / PRINT
43
FOLDER PATH : /IP/Patent
44
SAVE : 90 DAYS
UPDATE
45
VIEW
49
49A
CNFRM DEL FILE PATH
41
Develop1
IP
Patent
Sale
Account
42
JPA_▲▲1.pdf
JPA_▲▲2.pdf
JPA_▲▲3.pdf
JPA_▲▲4.pdf
JPA_▲▲5.pdf
JPA_▲▲6.pdf
46
47
FILE NAME JPA_▲▲1.pdf
REGISTRATION 2006/02/01 10:05
SIZE 110 KB
PAGES 8 P
DATE TO BE DEL 2006/05/01
PRINT
48
FILE PATH : C:/MyDocuments/JPA_▲▲119.pdf
61
REF
62
REG
63

FIG.5

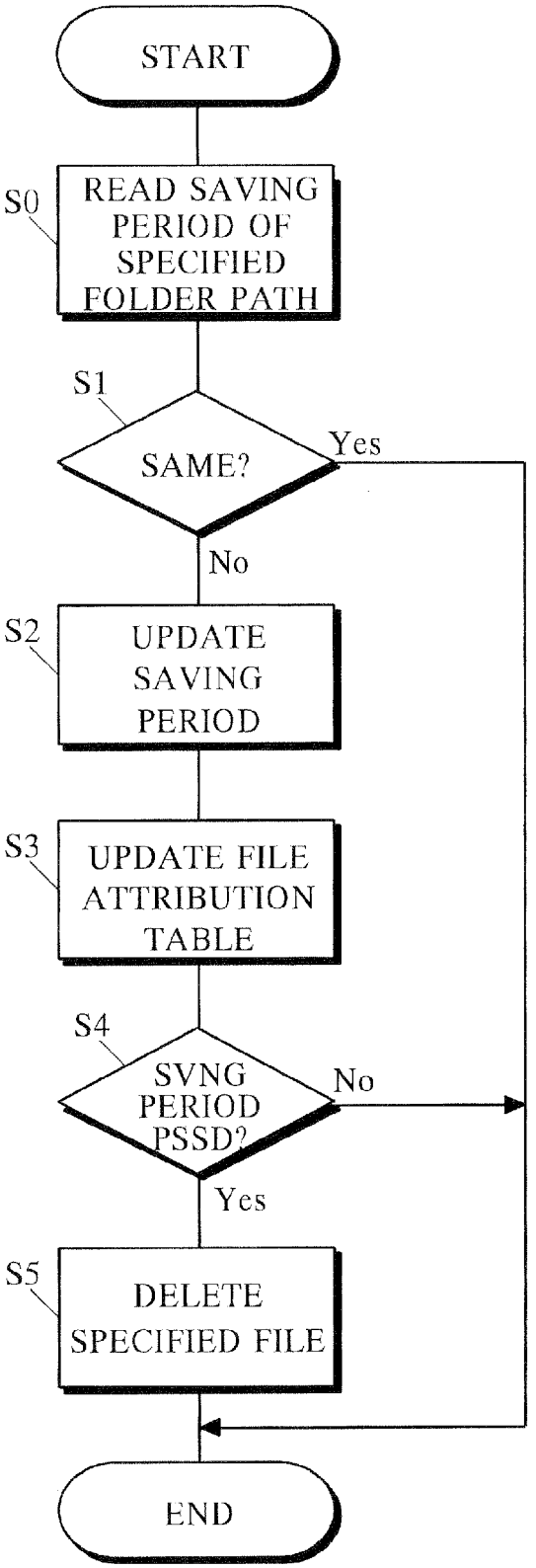
START
S0
READ SAVING PERIOD OF SPECIFIED FOLDER PATH
S1
SAME?
Yes
No
S2
UPDATE SAVING PERIOD
S3
UPDATE FILE ATTRIBUTION TABLE
S4
SVNG PERIOD PSSD?
No
Yes
S5
DELETE SPECIFIED FILE
END

FIG.6

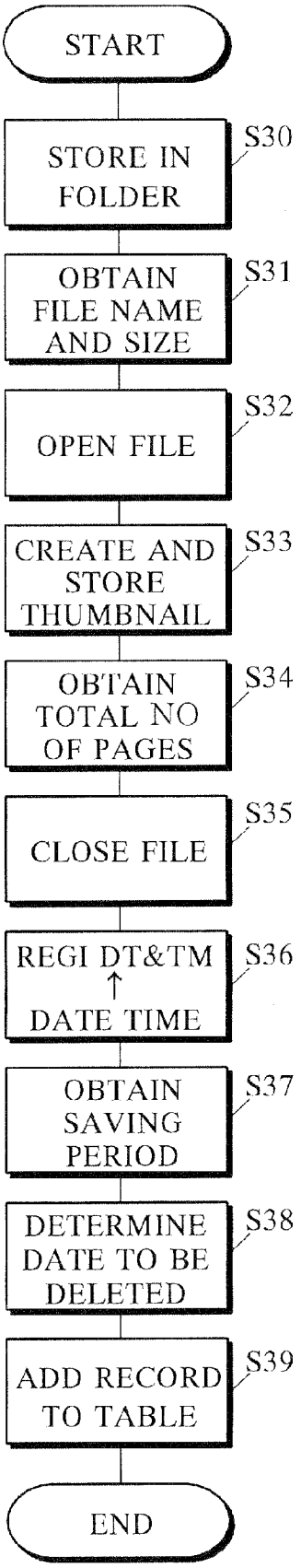
START
STORE IN FOLDER
S30
OBTAIN FILE NAME AND SIZE
S31
OPEN FILE
S32
CREATE AND STORE THUMBNAIL
S33
OBTAIN TOTAL NO OF PAGES
S34
CLOSE FILE
S35
REGI DT&TM
DATE TIME
S36
OBTAIN SAVING PERIOD
S37
DETERMINE DATE TO BE DELETED
S38
ADD RECORD TO TABLE
S39
END

FIG.7

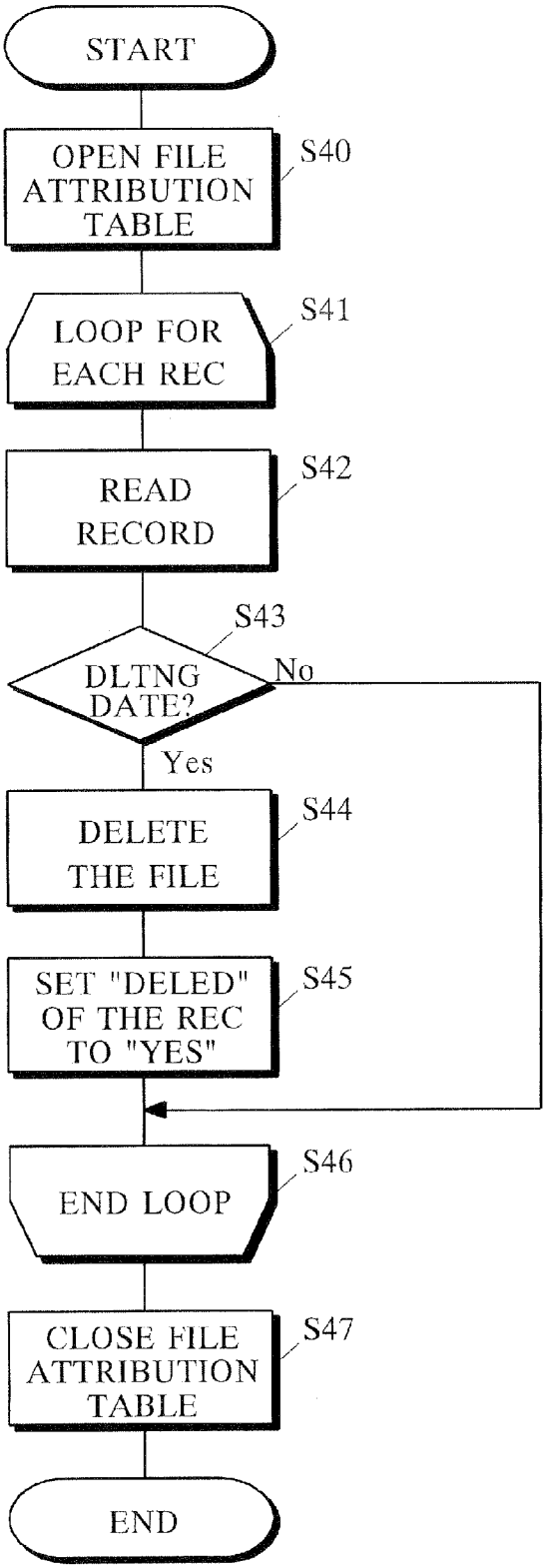
START
OPEN FILE ATTRIBUTION TABLE
S40
LOOP FOR EACH REC
S41
READ RECORD
S42
S43
DLTNG DATE?
No
Yes
DELETE THE FILE
S44
SET "DELED" OF THE REC TO "YES"
S45
END LOOP
S46
CLOSE FILE ATTRIBUTION TABLE
S47
END

FIG.8

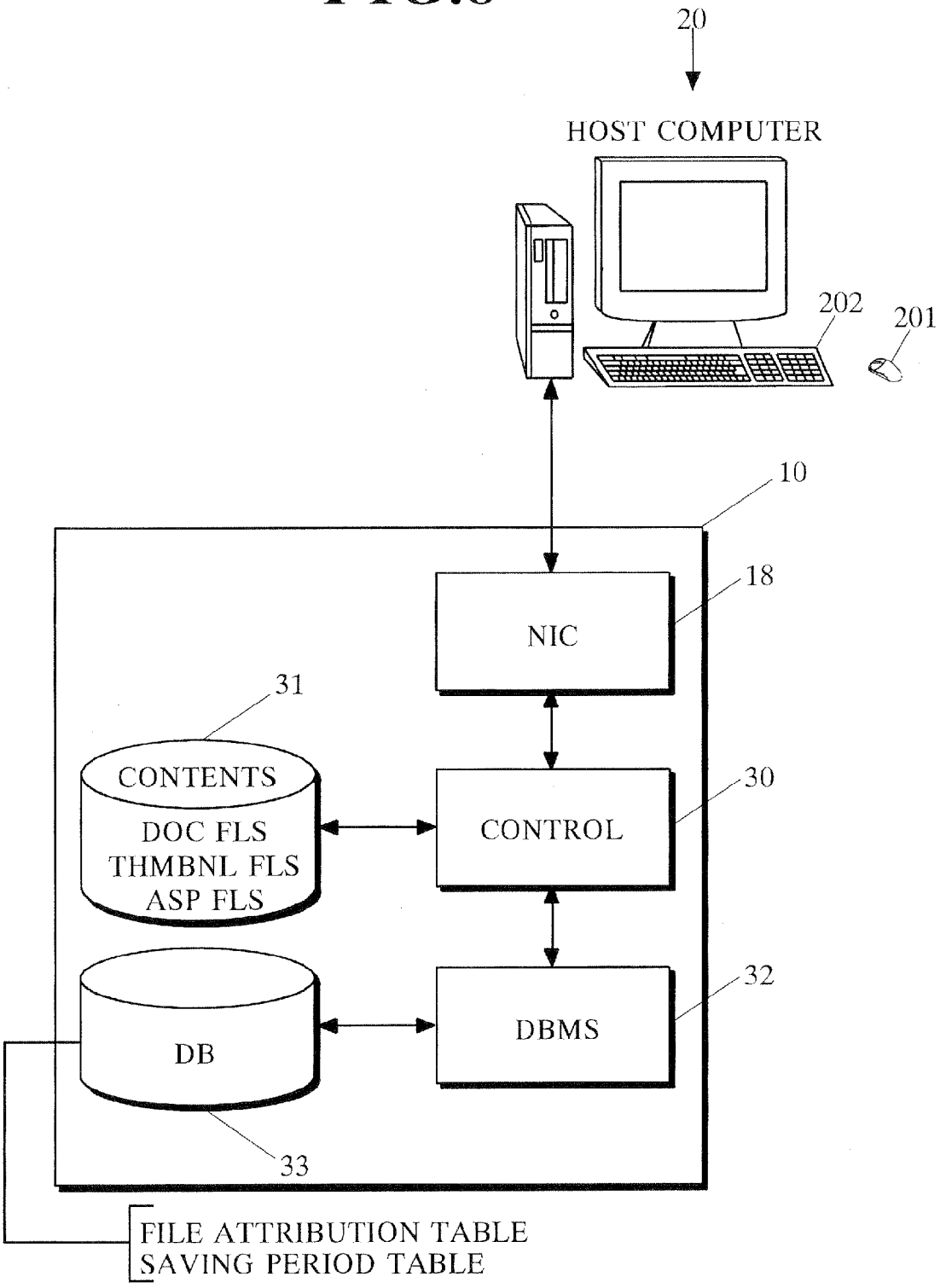
20
HOST COMPUTER
202
201
10
18
NIC
31
CONTENTS
DOC FLS
THMBNL FLS
ASP FLS
CONTROL
30
DB
DBMS
32
33
FILE ATTRIBUTION TABLE
SAVING PERIOD TABLE

FIG.9

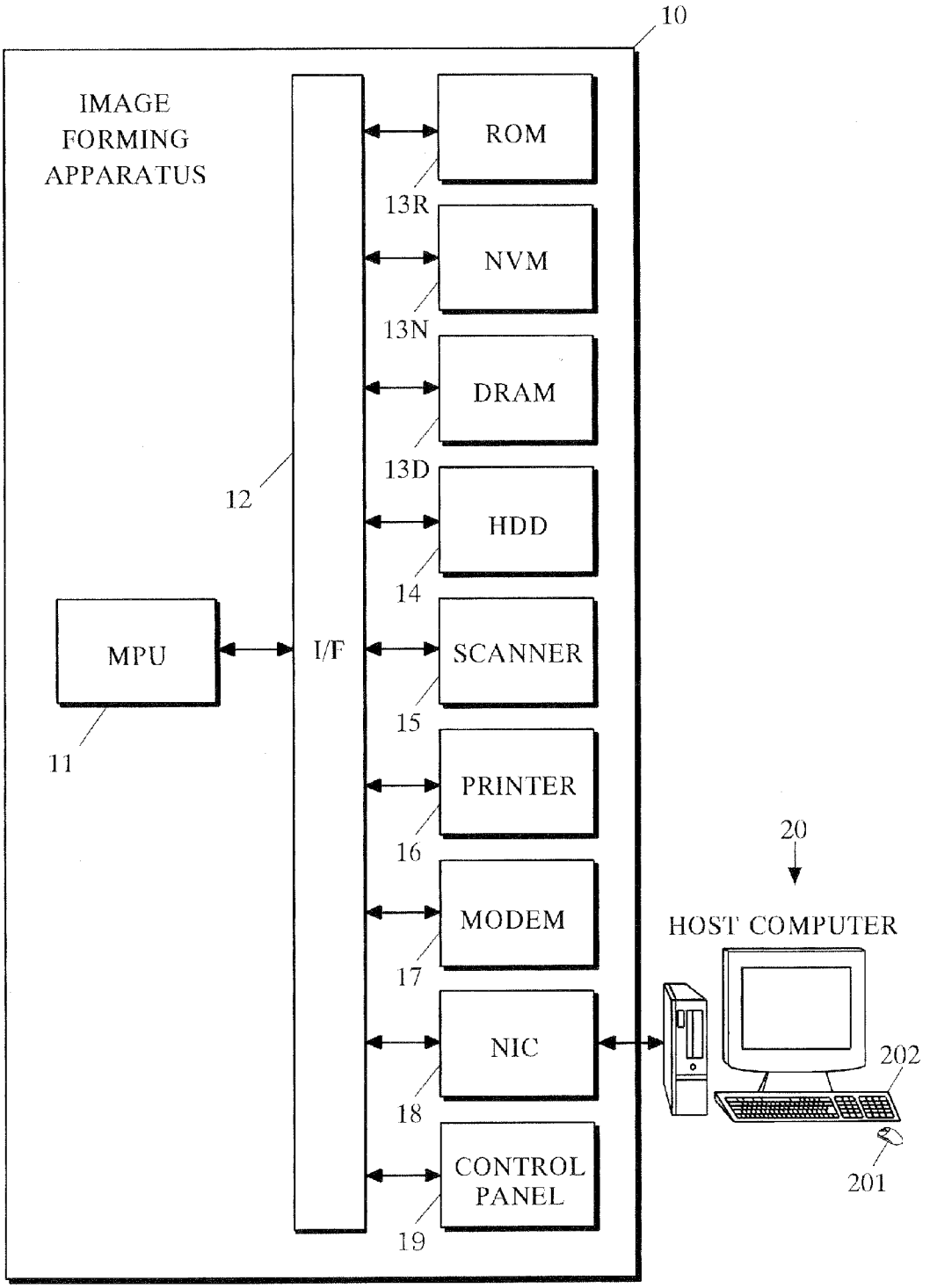
10
IMAGE FORMING APPARATUS
ROM
13R
NVM
13N
DRAM
13D
12
HDD
14
MPU
I/F
SCANNER
15
11
PRINTER
16
20
HOST COMPUTER
MODEM
17
NIC
202
18
CONTROL PANEL
201
19

IMAGE FORMING APPARATUS STORAGE FILES WITH FILE ATTRIBUTION TABLE HAVING DELETION DATE AND FLAG

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is based upon and claims the benefit of priority from the prior Japanese Patent Application No. 2006-171041 and 2006-171042, each filed on Jun. 21, 2006, the entire contents of which are incorporated herein by reference.

TECHNICAL FIELD

The invention relates to an image forming apparatus having a printing function and an auxiliary storage, and more specifically to an image forming apparatus having functions to store files onto an auxiliary storage, view files in the auxiliary storage, and delete files in the auxiliary storage.

BACKGROUND OF THE INVENTION

There are sold image forming apparatuses, especially multifunction machines, having a hard disk that a user can store files thereon to print out its contents when necessary.

In a case where a hard disk of such image forming apparatus is communal to many users, unnecessary files in the hard disk need to be deleted to avoid insufficiency in capacity.

JP No. 2004-199456-A discloses a configuration wherein a user schedules a date of file deletion when storing the file on a hard disk, and an email is sent to the user, when the set date of deletion is nearby, to inform the user of the date of deletion.

This configuration allows for extending a date of deletion if a user wants to extend it even if the user has forgotten the date of deletion.

Also, JP No. 2003-276272-A, discloses a configuration wherein an image forming apparatus displays a thumbnail of a document.

This configuration allows for easy verification of contents of a print target document before printing.

However, in a case of the above-mentioned JP No. 2004-199450-A, it can be bothersome for a user to set a date of deletion for each file. Furthermore, there can be left a lot of files without a date of deletion scheduled, because a user forgot to or because it is bothersome for a user to, frequently resulting in insufficiency in capacity of a hard disk or hindrance to an easy selection of necessary files. In addition, checking and deleting many unnecessary files will take a long time.

The invention of the above-mentioned JP No. 2003-276272-A is for the purpose of checking only one print target, when a memory card is inserted into an image forming apparatus, by displaying a thumbnail of a document stored in the memory card on a display panel of the image forming apparatus, but not for the purpose of readily and quickly checking and deleting many files on a hard disk in an image forming apparatus.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide an image forming apparatus having an auxiliary storage capable of easy and quick verification and deletion of unnecessary files stored in the auxiliary storage.

Another object of the present invention is to provide an image forming apparatus having an auxiliary storage capable of easy scheduling of a date of file deletion.

In a first aspect of the present invention, a file registration program and a fie view program are stored in program storing means,

wherein the file registration program orders a processor: in response to receipt of a file registration instruction, a file, and a folder path through a communication interface, to add a record having a path of the file and a registration date of the file into an auxiliary storage to a file attribution table, to store the file into a folder of the auxiliary storage, and to create a thumbnail of a specified pace of the file to store the thumbnail into the auxiliary storage,

wherein the file view program orders the processor:

in response to receipt of a view instruction from an inputting means or the communication interface, (a) to create a display data relating file names and registration dates of respective files in the file attribution table with respective thumbnails, and to provide the display data to a display means or through the communication interface to a host computer;

in response to receipt of a sort instruction and data indicating a sort item in the file attribution table and indicating either an ascending or descending order from the inputting means or through the communication interface, to sort records in the file attribution table, and to execute the processing of (a); and

in response to a file deletion instruction and deletion file identifying data from the inputting means or through the communication interface, to delete files identified by the deletion file identifying data from the auxiliary storage, to delete records corresponding to the deletion file identifying data from the file attribution table, and to execute the processing of (a).

This configuration has an advantage in that confirming and deleting files can be readily and quickly executed even if a lot of unnecessary files are stored in the auxiliary storage.

In a second aspect of the present invention, a saving period setting program, a file registration program, and an automatic file deletion program are stored in program storing means,

wherein the saving period setting program orders a processor: in response to receipt of a saving period registration instruction, a folder path, and data indicating a saving period from an inputting means or through a communication interface, to add a record having the folder path and a value relating to the data to a saving period table,

wherein the file registration program orders the processor: in response to receipt of a file registration instruction, a file, and a folder path from the inputting means or through the communication interface, to add a record having a path of the file and a registration date of the file in an auxiliary storage to a file attribution table, and to store the file into the folder of the auxiliary storage,

wherein the automatic file deletion program orders the processor: to refer to the saving period table, the file attribution table, and a current date to delete a file whose saving period has passed the current date from the folder and to delete a record corresponding to this file from the file attribution table.

This configuration has an advantage in that an appropriate date of deletion can be easily scheduled for each file, because a date of file deletion is automatically scheduled according to a user's indication of with folder to store a file, by assigning a saving period to the folder in advance.

In a third aspect of the present invention, a saving period setting program, a file registration program, and an automatic file deletion program are stored in storing means,

wherein the saving period setting program orders a processor: in response to receipt of a saving period registration instruction, a folder path, and data indicating a saving period from an inputting means or through a communication inter-

face, to add a record having the folder path and a value relating to the data to a saving period table,

wherein the file registration program orders the processor: in response to receipt of a file registration instruction, a file, and a folder path from the inputting means or through the communication interface, to add a record having a path of the file, a registration date of the file in the auxiliary storage, and a scheduled date of file deletion determined by referring the saving period table to a file attribution table, and to store the file into the folder of the auxiliary storage,

wherein the automatic file deletion program orders the processor: to refer to the file attribution table and a current date to delete a file whose saving period has passed the current date from the folder, and to delete a record corresponding to this file from the file attribution table.

This configuration has an advantage similar to the advantage of the above-mentioned second aspect of the present invention. In addition, there is an advantage in that the configuration can be simplified because the automatic file deletion program does not require a reference to the saving period table.

Other aspects, objects, and advantages of the present invention will become apparent from the following detailed description taken in connection with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWING

FIG. **1** is a flowchart of processing by an event handler on a side of an image forming apparatus incurred by pressing of a selected item, a delete button, page designation, or a print button displayed by a browser in a host computer;

FIG. **2** is an illustration of a content display screen displayed by a browser in a host computer;

FIGS. **3**A and **3**B are illustrations of a file attribution table and a saving period table, respectively;

FIG. **4** is an illustration of a remote control panel on a side of a host computer for operating remote image forming apparatus;

FIG. **5** is a flowchart of saving period updating processing on a folder on a side of an image forming apparatus;

FIG. **6** is a flowchart of processing by a program of storing a file on a host computer into a specified folder on a hard disk in an image forming apparatus;

FIG. **7** is a flowchart of processing by an automatic file deletion program;

FIG. **8** is a schematic block diagram associated with a server function of one embodiment according to the present invention; and

FIG. **9** is a schematic block diagram of a hardware configuration of the image forming apparatus.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, wherein like reference characters designate like or corresponding parts throughout several views, preferred embodiment of the present invention will be described below.

FIG. **9** is a schematic block diagram showing a hardware configuration of an image forming apparatus of one embodiment according to the present invention.

In this image forming apparatus **10**, an MPU (micro-processing unit) **11** is connected via an interface **12** to a ROM **13**R, an N (nonvolatile memory) **13**N, a DRAM (dynamic random access memory) **13**D, a hard disk **14**, a scanner **15**, a printer **16**, a modem **17**, a NIC (network interface card) **18**, and a control panel **19**. For sake of simplification, plural interfaces are illustrated as a single block in FIG. **9**.

In the ROM **13**R, a boot strap and BIOS are stored. In the NVM **13**N such as a flash memory, various settings are stored. The DRAM **13**D is for a main memory. In the hard disk **14**, an operating system (OS), an application operating on the OS, a web server, web applications, a database management system (DBMS), and various device drivers operating under the OS, and data files including a database are stored. The application includes a program that directs the image forming apparatus **10** to function as a multifunction machine, functions of which include copying, scanning, printing, and faxing. The application also includes a program to view, delete, and print a document file stored in the hard disk **14** using a host computer **20** via the NIC **18**, and a program on a side of the image forming apparatus **10** to store a file on a side of the host computer **20** onto the hard disk **14** in the image forming apparatus **10**.

The scanner **15** is for inputting images in copying and facsimile transmittance. The printer **16** has a print engine, a fixing device, a paper feeder, a paper carrier, and a paper discharger. Based on bit map data provided as printing data, the printer **16** forms an electrostatic latent image on a photoconductor drum of the print engine, develops the electrostatic latent image with toner, transfers and fixes the toner image onto a paper, and discharges the paper. The modem **17** is for sending and receiving facsimiles. The NIC **18** is coupled to the host computer **20** on a network, and is used for accessing files of print jobs and the hard disk **14**. The control panel **19** is for inputting settings or commands and displaying, for example, settings and a status.

FIG. **8** is a schematic block diagram associated with a server function of the image forming apparatus **10**.

A control section **30** of the image forming apparatus **10** is equipped with an OS, a web server (program) and a web application server (program) operating on the OS.

If an request from the host computer **20** is provided via the NIC **18** to the control section **30** of the image forming apparatus **10**, the control section **30**, in response to this, performs a process such as one described below, following a program included in an ASP (Active Server Pages) file in contents **31**. That is, the control section **30** accesses a database **33** via a DBMS **32**, creates an HTML files by merging data obtained from the database **33** and a thumbnail file in the contents **31**, and provides with the HTML file via the NIC **18** to a browser of the host computer **20**.

These programs of control section **30** and DBMS **32**, the database **33** and contents **31** are stored in the hard disk **14**.

In the hard disk **14**, a plurality of folders forming a hierarchical structure are created, and document files, together with respective thumbnail files, arc scored in each folder. A thumbnail file may be a JPEG file, for example, and is a contracted image file or a predetermined page that is representative of each document file, which is a contracted image file of a first page in this embodiment according to the present invention. A path of a document file and, a path of a thumbnail file are corresponding to each other, and thus a name of either one suggests the other. For example, if a path of a document file is /Data/Bin.pdf, a path of its thumbnail file is /Data/Bun_sn-.jpg.

The database **33** includes a file attribution table **330** as exemplarily shown in FIG. **3**A, and a saving period table **331** as exemplarily shown in FIG. **3**B.

In the saving period table **331**, paths and saving periods set for respective folders are stored. The unit of saving period is "day" in this embodiment of the present invention. A saving period set at 0 means no setting (an infinite saving period).

On the other hand, the file attribution table **330** includes fields of a file path including a file name, date and time of the file stored onto the hard disk **14**, a data size of the file (MB), a total number of pages of the file, a (scheduled) date of file deletion, and a deleted flag.

A (scheduled) date of file deletion is a saving period added to a registration date of the file, and the saving period is set onto a folder which includes the file. A (scheduled) date of file deletion indicates a scheduled date of file deletion until the saving period has passed, and indicates a date of file deletion after the saving period passed and the file was automatically deleted. A scheduled date of file deletion set at "0", being correspondent to a saving period set at "0", indicates that deletion of the file is not scheduled. A delete flag comes useful in determination of whether a file was stored and has been automatically deleted or a file is originally not stored, because file deletion is automatically performed.

FIG. **4** is an illustration of a remote control panel **40** for the image forming apparatus **10**, which is displayed by starting a specified application on a side of the host computer **20**.

The remote control panel **40** is for setting a file saving period by specifying each folder in the hard disk **14** in the image forming apparatus **10**, storing a file on a side of the host computer **20** into a specified folder in the hard disk **14**, viewing an attribution and a thumbnail of each document file in a specified folder in the hard disk **14**, or printing a selected document file in the hard disk **14**.

In a folder view object **41** in the remote control panel **40**, folders in the hard disk **14** are displayed in a hierarchical style. By clicking upon a folder in the folder view object **41** with a pointing device **201**, the folder is opened and file names inside the folder are displayed on a file view object **42**. Each of the folder view object **41** and the file view object **42** is equipped with a scroll bar.

In a text box **43**, the path of a folder at a lowest layer opened (selected, in the folder view object **41** is displayed. In a text box **44**, the saving period set onto a folder which is specified by this path is displayed. This value is a corresponding value in the saving period table **331**.

To change saving periods, a user sets the text box **44** as a selected state, operates a keyboard **202** to input a value in the text box **44**, and presses an update button **45**. By this operation, contents of the text box **43** and **44**, together with an update command, are transmitted from the host computer **230** via the NIC **18** to the control section **30**. In response to this, the control section **30** performs processing as shown in FIG. **5**. In the following description, characters in parenthesis are step identifiers in the drawings.

(S**0**) The control section **30** opens the saving period table **331** in the database **33** via the DBMS **32**, and reads a saving period of a specified folder path.

(S**1**) The control section **30** ends the processing if this read saving period is identical with the received saving period; otherwise, proceeds to step S**2**.

(S**2**) The control section **30** update this saving period in the saving period table **331** with the received value.

(S**3**) The control section **30** opens a file attribution table **330** in the database **33**, and for the files in this folder path, updates each scheduled date of deletion with the saving period added to a registration date.

(S**4**) The control section **30** proceeds to step S**5** if this updated value indicates that its saving period is over; otherwise, ends the processing.

(S**5**) The control section **30** deletes the file whose saving period is over, and set "deleted" flag of the file in this record in the attribution table **330** to "YES".

Referring back to FIG. **4**, when a file name in the file view object **42** is clicked with the pointing device **201**, the file name and a folder path displayed in thee text box **43** are provided from the host computer **20** via the NIC **18** in the image Forming apparatus **10** to the control section **30**. In response to this, the control section **30** refers to the file attribution table **330** in the database **33** via the DBMS **32**, reads a corresponding record and a corresponding thumbnail file in the contents **31**, and provides them for the host computer **20** via the NIC **18**. Upon this processing, a thumbnail **46** and file attributions **47** of the file are displayed as illustrated in FIG. **4**. Since a deleted file cannot be selected in the file view object **42**, the file attributions **47** do not include "deleted"; corresponding to this, a "date to be deleted", instead of a "(scheduled) date of file deletion", is included.

Viewing this screen, if a user determines to print the specified file, he presses a print button **48**. Upon this, a print setting screen, which is not illustrated in the drawings, is displayed. If a total number of pages is relatively large, the user may change settings of print attributions such as both sides printing or integrated printing, on this screen. If an execute button, which is not illustrated in the drawings, is pressed after the screen is displayed, the command is sent to the control section **30** together wit the print attributions. Responding to this, the control section **30** reads a document file in the contents **31** and executes a print job based on the print attributions.

In order to view attributions of each file in a folder specified in the text box **43**, a user presses a view button **49**. Here, the remote control panel **40** communicates with a browser of the host computer **20** via a shared memory area. The view button **49** being pressed, contents of the text box **43** and a path of a ASP file, on a side of the image forming apparatus **10**, for viewing are provided via the browser and the NIC **18** to the control section **30**.

In response to this, according to a program included in the ASP file in the contents **31**, the control section **30** accesses the database **33** via the DBMS **32**, creates an HTML file by combining data in a folder path specified in the text box **43** with thumbnail files in the contents **31**, and provides a browser of the host computer **20** via the NIC **18** with the HTML file.

With this processing, a contents displaying panel **50** as illustrated in FIG. **2** is displayed by a browser of the host computer **20**. Next, this contents displaying panel **50** is explained below.

In a text box **51**, a folder path in the hard disk **14** of the image forming apparatus **10** is displayed.

In addition, a thumbnail **53** and file attributions **54** respectively corresponding to the thumbnail **46** and the file attributions **47** in FIG. **4** are displayed in a relatively large cell **52** in a table.

Besides, every click on a check box **55** with the pointing device **201** replaces a check mark being displayed (selected) will not being displayed (unselected) and vice versa in turn; in response to this, each check box **550** in the each cell **52** interchange similarly. A check box **550** in the each cell **52** is for a user's selecting and selection clearing in turn individually.

An up/down button **56** and a sort item group **57** are for sorting. In other words, every click on the up/down button **56** reverses a direction of a triangle, interchanging an ascending order and a descending order. In the sort item group **57**, a file name **570**, a registration date **571**, a data size **572**, a total number of pages **573** and a scheduled date of deletion **574** are included; clicking each of which with the pointing device **201** provides a folder path written in the text box **51**, a selected sort item, and data indicating an ascending order or a

descending order corresponding to the up/down button **56**, together with a sort command, from a browser of the host computer **20** via the NIC **18** of the image forming apparatus **10** to the control section **30**.

Every click on any selected one of the above-mentioned items, a delete button **58**, a page designation **59**, or a print button **60** with a pointing device **201** provides data corresponding to the clicked object from a browser of the host computer **20** via the NIC **18** of the image forming apparatus **10** to the control section **30**, and processing as shown in FIG. **1** is performed in the control section **30**.

(S**10**, S**16**, S**20**, S**23**) If the clicked object is an item in the sort item group **57**, the delete button **58**, the page designation **59**, or the print button **60**, the control section **30** determines to be affirmative in steps S**1**, S**16**, S**20**, or S**23**, respectively, and proceeds to steps S**31**, S**17**, S**21**, or S**24**, respectively.

(S**11** to S**13**) The control section **30** opens the file attribution table **330** in the database **33** via the DBMS **32**, and sorts all the files included in the folder whose path is written in the text box **51** by either a ascending order or a descending order indicated in a state of the up/down button **56**, regarding selected items in the sort item group **57**.

(S**14**) The control section **30** creates an HTML file of appropriate page having thumbnails and file attribution data which are arranged in an order of sorted records.

(S**15**) The control section **30** transmits the HTML file to the browser of the host computer **20** via the NIC **18** and ends the processing of FIG. **1**. Thereby, the browser displays the contents display panel **50** having sorted thumbnails and data.

(S**17**) The control section **30** deletes document files having file names checked in the check box **550**, from the contents **31**.

(S**18**) The control section **30** opens the file attribution table **330** in the database **33** via DBMS **32**, and deletes records corresponding to the deleted files.

(S**19**) Regarding undeleted files in this folder, the control section **30** creates an HTML file of appropriate page having thumbnails and file attribution data arranged, and proceeds to step S**15**.

(S**21**) The control section **30** obtains records of files corresponding to a specified viewing page among all files in the specified folder, from the file attribution table **330**.

(S**22**) The control section, **30** relates these records with respective thumbnails to ore ate an HTML file, and proceeds to step S**15**.

(S**24**) Regarding one or more files having names checked in the check box **550**, the control section **30** creates print jobs to print out according to specified print attributions, and execute them.

Referring back to FIG. **4**, if a deleted file confirming button **49**A is pressed, a folder path in the text box **43**, together with a deleted file identifying command, is provided from the host computer **20** via the NIC **18** of the image forming apparatus **10** to the control section **30**. Responding to this, the control section **30** opens the file attribution table, finds out records whose "deleted" flag are "Yes" in regard to file paths in this folder path, and transmits these records to the host computer **20** via the NIC **18**. In the host computer **20**, a window, not shown, is opened to display a list of the records regarding deleted files. A deletion button is displayed on this window, and if this button is pressed, the folder path in the text box **43**, together win a record deletion command, is provided from the host computer **20** via the NIC **18** of the image forming apparatus **10** to the control section **30**. Responding to this, the control section **30** finds nut the records with "deleted" flag being "Yes" in regard to the folder path in the file attribution table, and deletes these files.

Next, registration of a file on a side of the host computer **20** in a specified folder in the hard disk **14** of the image forming apparatus **10** is explained below.

A path of a file stored in a HDD of the host computer **20** or a removable memory device such as a USB memory coupled to he host computer **20**, is written in a text box **61** in FIG. **4**. Instead of writing in this way, the path in the text box **61** may be written by pressing a browse button **62** to start a program which displays objects equivalent to the folder view object **41** and the file view object **42** and selecting a file in the folder similarly to selecting a file in the file view object **42**.

Pressing a registration button **63** next provides a file path written in the text box **61**, a file thereof and a folder path written in the text box **43**, together with a registration command, from the host computer **20** to the control section **30** via the NIC **13** of the image forming apparatus **10**. Responding to this, the control section **30** performs processing shown in FIG. **6**.

(S**30**) The received file is stored in a folder specified by a path in the text box **43**.

(S**31**) The name and size of this file are obtained.

(S**32**) This file is opened.

(S**33**) A contracted image of the first page is created as a thumbnail and stored in the same folder.

(S**34**) A total number of pages include in this file is obtained from an appropriate position in the file, the position being predetermined according to the extension identifier of the file.

(S**35**) This file is closed.

(S**36**) A current date and time is set as a date and time of registration.

(S**37**) The saving period table **331** is opened to obtain a saving period of the folder mentioned in step S**30**.

(S**38**) This saving period is added to the registration date, and a scheduled deletion date of the file is determined.

(S**39**) The data obtained in steps S**31**, S**34**, S**36**, S**37**, and S**38** are added to the file attribution table **330** as a new record.

File registration onto the hard disk **14** is performed with these steps described above.

Next, an automatic file deletion program is explained below. FIG. **7** is a flowchart showing a processing by this program.

This program is performed once a day, at a predetermined time or right after starting up a host computer. Because file registration decreases free spaces in the hard disk **14**, the program may be performed at a time of file registration and not more than once a day.

(S**40**) The file attribution table **330** is opened.

(S**41**) For each record in this table, the following steps S**42** to S**45** are executed.

(S**42**) A record is read.

(S**43**) if a "scheduled date of deletion" of his record is a current day, the process goes to step S**44**; otherwise, goes to step S**46**.

(S**44**) A file identified by a "file path" of this record is deleted.

(S**45**) A delete flag of this record is set to "Yes".

(S**43**) If this processing is not completed for all the records, moving to a next record is performed and the process goes back to step S**42**.

(S**47**) The file attribution table **330** is closed.

This embodiment according to the present invention has an advantage in that a user can readily and quickly confirm and delete unnecessary files, even if many unnecessary files are stored in the HDD **14**, since the following structure is adopted.

That is, in response to receipt of a document file, a folder path, and a file registration request through the NIC **18**, a path of the document file and a date of the file reiteration to the HDD **14** are related and written in the file attribution table **330**. Then this document file is stored into the folder in the HDD **14**, and a thumbnail of a first page of the document file is created and stored in the HDD **14**.

Besides, in response to a view request through the NIC **18**,

(a) a file path and a registration date of the file included in a record of the file attribution table **330** are related with a thumbnail to create an HTML file, which is next transmitted to the host computer **20**;

records in the file attribution table **330** are sorted in response to receipt of a sort request through the NIC **18**, a sort item corresponding to any field in the file attribution table **330**, and data indicating either a ascending order or a descending order;

next the processing (a) is executed;

in response to receipt of a file deletion request and a file path as identifying data of a deletion file through the NIC **18**, a document file identified by this file path is deleted from the HDD **14**, and a record corresponding to the file path is deleted from the file attribution table **330**; and

the processing a) is executed.

In addition, since a total number of pages of contents of a document file is also related with a file path and stored in the file attribution able **330**, a total number of pages is displayed together with a thumbnail when viewing a file; therefore, there is an advantage in that a user can take a total number of pages into account and perform a double sided printing or an integrated printing with contraction.

Besides, since a data size of a document file is also related with a file path and stored in the file attribution table **330**, a data size is displayed together with a thumbnail when viewing a file; therefore, there is an advantage in that a user can take a data size into account and effectively manage files especially when free spaces in the HDD **14** become small.

Moreover, by sorting with selective manipulation of any of the up/down button **56** and sort items **570** to **574** on the panel **50** and manipulation of the check boxes **55** and **550**, there is an advantage in that file deletion is readily performed.

Furthermore, there is an advantage in that a user can readily and quickly delete document files stored in the HDD **14** of the image forming apparatus **10** while confirming each of them by using an existing browser stored in the host computer **20** connected to the image forming apparatus **10**.

Although a preferred embodiment of the present invention have been described, it is to be understood that the invention is not limited thereto and that various changes and modifications may be made without departing from the spirit and scone of the invention.

For example, a saving period of a subdirectory may be assumed to be identical with that of a parent directory. In this structure, it is possible to create folders having different saving periods to each other and then inside each folder, create a plurality of subfolders of various types.

In addition, although a structure wherein, when string a file onto a hard disk of an image forming apparatus, a thumbnail of a specified page of the file is created and a file attribution is written in the file attribution table **330** (S**31** to S**39**), has been described in the embodiment according to the present invention above, these processes may be performed when creating a view screen of FIG. **2**. With this structure, the present invention is applicable to existing devices wherein files are already stored.

Besides, instead of making a (scheduled) date of file deletion in the file attribution table **330**, a scheduled date of file deletion may be counted when needed with referring to the saving period table **331**.

Moreover, although a structure where the contents display panel **50** is displayed by a browser on the side of the host computer **20** has been described in the embodiment above, the display panel **50** may be displayed on a side of the host computer **20** by using a dedicated application.

Furthermore, the remote control pane **40** may be split in, for example, two screens, in order to make narrow and displayed on the control panel **19** of the image forming apparatus **10**.

Furthermore, the file view program, in response to receipt of a request through the communication interface from a host computer, may order the MPU **11** to transmit a deletion file selecting script program and a file deletion demanding script program which are interpreted and executed through a browser of the host computer **20**, wherein the deletion file selecting script program orders a processor of the host computer **20** through the browser: in response to receipt of an input of deletion file selection, to relate a mark indicating a deletion file to the name thereof and to display the mark on a window of the browser, wherein the file deletion demanding script program orders the processor of the host computer **20** through the browser: in response to receipt of a file deletion instruction, to transmit the file deletion instruction and data having the file name corresponding to the mark to the NIC **18**.

In addition, for example, a DVD (digital video disc) and its recording and playback equipment or a USB (universal serial bus) memory may be used instead of the HDD **14**.

What is claimed is:

1. An image forming apparatus comprising:

a processor;

program storing means, coupled to the processor, for storing programs;

an auxiliary storage, coupled to the processor, for storing data files for printing, a file attribution table having fields of a file path, a registration date of the file, a deletion date of the file, and a delete flag, and a saving period table having fields of a folder path and a saving period;

control panel means, coupled to the processor, having display means and inputting means; and

a communication interface coupled to the processor;

wherein the programs comprises a file registration program, a file view program, and an automatic file deletion program,

wherein the file registration program orders the processor:

in response to receipt of a file registration instruction, a file, and a folder path through the communication interface, to add a record having a path of the file, a current date as a registration date of the file, a current date plus saving period of the corresponding record on the saving period table as the deletion date of the file, and a delete flag of a value indicating that the file has not been deleted to the file attribution table, to store the file into the folder of the auxiliary storage, and to create a thumbnail of a specified page of the file to store the thumbnail into the auxiliary storage,

wherein the file view program orders the processor:

in response to receipt of a view instruction from the inputting means or the communication interface, (a) to create a display data having file names, and registration dates, and deletion dates of respective records having a delete flag value indicating not having been deleted on in the file attribution table with respective thumbnails, and to

provide the display data to the display means or through the communication interface to a host computer; and

in response to receipt of a sort instruction and data indicating a sort item on the file attribution table and indicating either an ascending or descending order from the inputting means or through the communication interface, to sort records on the file attribution table, and to execute the processing of (a); and

wherein the automatic file deletion program orders the processor to delete each file whose deletion date of corresponding record on the file attribution table is equal to a current date, and to change the value of the delete flag at this record into a value indicating having been deleted while keeping the corresponding file path in the file attribution table.

2. The image forming apparatus according to claim **1** wherein the record added to the file attribution table further includes a total number of pages of contents in a data file for printing,

wherein the display data further has the total number of pages.

3. An image forming apparatus according to claim **1** wherein the record added to the file attribution table further includes a data size of a data file for printing,

wherein the display data further has the total number of pages.

4. An image forming apparatus according to claim **1** wherein the file view program further orders the processor:

in response to an input of a deletion file selection from the inputting means or through the communication interface, to add data of a mark indicating a deletion file and a file name thereof to the display data.

5. An image forming apparatus according to claim **1** wherein the file view program, in response to receipt of a request through the communication interface from a host computer, orders the processor to transmit a deletion file selecting script program and a file deletion demanding script program which are interpreted and executed through a browser of the host computer,

wherein the deletion file selecting script program orders a processor of the host computer through the browser:

in response to receipt of an input of deletion file selection, to relate a mark indicating a deletion file to the name thereof and to display the mark on a window of the browser,

wherein the file deletion demanding script program orders the processor of the host computer through the browser:

in response to receipt of a file deletion instruction, to transmit the file deletion instruction and data having the file name corresponding to the mark to the communication interface.

6. An image forming apparatus comprising:

a processor;

storing means, coupled to the processor, for storing programs and data, the programs having a saving period setting program, a file registration program, and an automatic file deletion program, the data having a saving period table and a file attribution table; and

a communication interface coupled to the processor;

wherein the saving period setting program orders the processor:

in response to receipt of a saving period registration instruction, a folder path, and a saving period through the communication interface, to add a record having the folder path and the saving period to the saving period table,

wherein the file registration program orders the processor:

in response to receipt of a file registration instruction, a file, and a folder path through the communication interface, to add to the file attribution table a record having a path of the file, a registration date of the file, the registration date plus the saving period of the corresponding record on the saving period table as a deletion date of the file, and a delete flag of a value indicating not having been deleted, and to store the file into the folder,

wherein the automatic file deletion program orders the processor to delete each file whose deletion date of corresponding record on the file attribution table is equal to a current date, and to change the value of the delete flag at this record into a value indicating having been deleted while keeping the corresponding file path in the file attribution table.

7. The image forming apparatus according to claim **6** wherein the programs further have an information processing program for deleting flags which orders the processor to:

in response to receipt of a deleted file confirming instruction with a folder path through the communication interface, to find out records each of which has a delete flag indicating having been deleted, and to send back contents of the records; and

in response to receipt of a deleted instruction with a folder path through the communication interface, to delete records each of which has a delete flag indicating having been deleted and has the folder path.

8. The image forming apparatus according to claim **7** wherein the programs further have a view processing program which orders the processor to:

in response to receipt of a sort instruction with a folder path and a sort item which is equal to one of the fields on the file attribution table, and an order indicating either an ascending or descending through the communication interface, to sort records on the file attribution table in accordance with the sort instruction, and to send back contents of the sorted records.

9. The image forming apparatus according to claim **6** wherein the programs further have a view processing program which orders the processor to:

in response to receipt of a sort instruction with a folder path and a sort item which is equal to one of the fields on the file attribution table, and an order indicating either an ascending or descending through the communication interface, to sort records on the file attribution table in accordance with the sort instruction, and to send back contents of the sorted records.

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